WIA1002/WIB1002 DATA STRUCTURE

LAB TEST 2

INSTRUCTION:

- **Create a Netbeans Project Name: MatrixNumber_Test2 and save a copy of your source codes to Z drive (Z:).**
- **Write your name, matrix number, tutorial/lab group, lecturer's name on each file.**
- **Put away all your books/notes. Off your mobile phone. Do not communicate with anyone except your lecturer or teaching assistants. Treat this as a real exam.**
- **Any form of misconduct (copying) will be severely penalized.**

TIME ALLOCATION: 60 minutes

QUESTION

a) Modify the `MyArrayList` class to become a generic class called `MyGenericArrayList`.

```java
import java.util.ArrayList;

public class MyArrayList {

        private ArrayList list = new ArrayList();

        public void add(Object obj) {
                list.add(obj);
                System.out.println(obj + " is added to the list.");
        }

        public void printAll() {

                System.out.println("\nPrint all elements in the list: ");

                for (Object obj: list) {
                        System.out.println(obj);
                }

                System.out.println();
        }


        public static void main(String[] args) {
                MyArrayList myList = new MyArrayList();
                myList.add(10);
                myList.add("Java");

                myList.printAll();

        }

    }
```

b) Modify the test program to create two instances of the generic class of type String called `strList` and of type Integer called `intList`. Add elements to each list using the `add()` method and display all the elements of each list using the `printAll()` method.

A sample output of the test program:

```
10 is added to the list.
5 is added to the list.
20 is added to the list.

Print all elements in the list:
10
5
20

I is added to the list.
love is added to the list.
data structure is added to the list.

Print all elements in the list:
I
love
data structure
```

Make the following changes to the `MyGenericArrayList` class:

c) Modify the `printAll()` method to print all the objects in a list using the `toString()` method.

A sample output of the test program using new `printAll()` method:

```
10 is added to the list.
5 is added to the list.
20 is added to the list.

Print the list:
[10, 5, 20]

I is added to the list.
love is added to the list.
data structure is added to the list.

Print the list:
[I, love, data structure]
```

d) Modify the `add()` method to add a new entry in ascending order using the `compareTo()` method to compare the values.

A sample output of the test program using new `printAll()` and `add()` methods:

```
10 is added to the list.
5 is added to the list.
20 is added to the list.

Print the list:
[5, 10, 20]

I is added to the list.
love is added to the list.
data structure is added to the list.

Print the list:
[I, data structure, love]
```

END

The marking scheme for Lab Test 2:

- 4 marks – You will score **FULL** marks if you are able to answer all parts: (a), (b), (c), (d) of the questions correctly → WELL DONE!
- 3 marks – You will score **THREE** marks if you are able to answer 3 parts of the questions: (a), (b), (c) OR (a), (b), (d) → GOOD!
- 2 marks - You will score **TWO** marks if you are able to answer 2 parts of the questions: (a), (b).
- 1 mark – You will score **ONE** marks if you are able to answer part (a) only.
- 0 mark – You will get score **ZERO** if and only if you are not able to answer any part of the question correctly.